

TABLE 21.—*Analysis of the isopleths*

Station	N. lati- tude	Maximum		Minimum		Symmetry	Average daily radia- tion Gram- cal.	Departure from compo- site of con- tinental United States	Percent
		Noon. Week be- ginning—	Daily. Week be- ginning—	Noon. Week beginning—	Daily. Week be- ginning—				
San Juan.....	18 28	Feb. 26.....	Apr. 16.....	Jan. 1.....	Jan. 1.....	Very irregular; many crests	520	+44	
Miami.....	25 41	Apr. 16.....	June 4.....	Sept. 23.....	Dec. 10, Dec. 24.....	Somewhat irregular; several crests	392	+9	
New Orleans.....	29 56	June 11.....	June 18.....	Dec. 24.....	Dec. 24.....	Rather smooth	369	+2	
La Jolla.....	32 50	Apr. 30.....	June 4.....	Dec. 10.....	Dec. 10.....	Fairly smooth; many crests	416	+16	
Riverside.....	33 58	June 11.....	June 11.....	do.....	do.....	Fairly smooth; few crests	410	+14	
Fresno.....	36 43	July 2.....	July 2.....	Dec. 17.....	Dec. 17.....	Very smooth; few crests	466	+29	
Washington.....	38 56	do.....	do.....	Dec. 10.....	Dec. 10.....	do.....	341	-5	
New York.....	40 46	do.....	do.....	Jan. 1.....	Jan. 1, Dec. 17.....	Irregular; many crests	304	-16	
Lincoln.....	40 50	do.....	do.....	Dec. 10.....	Dec. 10.....	Exceedingly smooth; only 1 crest	376	+4	
Chicago.....	41 47	July 9.....	do.....	Dec. 3.....	Dec. 3.....	Very smooth; few crests	273	-24	
Blue Hill.....	42 13	May 28, July 2.....	do.....	do.....	do.....	Rather irregular; many crests	343	-5	
Twin Falls.....	42 29	May 21, July 16.....	May 21.....	Dec. 24, Jan. 8.....	Dec. 24, Jan. 8.....	Very smooth; many crests	375	+4	
Madison.....	43 05	July 2, July 23.....	July 9.....	Jan. 1, Jan. 8.....	Jan. 1.....	Fairly smooth	343	-5	
Friday Harbor.....	48 32	July 16.....	July 16.....	Dec. 17, Jan. 8.....	Dec. 24.....	Smooth; many crests	331	-8	
Fairbanks.....	64 52	June 11.....	June 11.....	Dec. 10, Dec. 17, Jan. 1.....	Dec. 10, Dec. 17, Jan. 1.....	Irregular at noon; otherwise smooth	226	-33	
Composite of 10 sta- tions.....	39 58	July 2.....	July 2.....	Dec. 17.....	Dec. 17.....	Very smooth	360	-----	

*Stations included in the composite.

NOTES AND REVIEWS

Seventh Pacific Science Congress.—If world conditions permit, it is planned to hold the Seventh Pacific Science Congress at Manila in 1943, probably about November, under the auspices of the National Research Council of the Philippines. Father C. E. Depermann, S. J., Assistant Director of the Philippine Weather Bureau, has been appointed Secretary for the section of meteorology and climatology.

Several symposia on subjects of general interest to the Pacific are being tentatively considered; and in addition, any papers contributing to the meteorology or climatology of the Pacific region will be welcomed.

The Secretary extends an invitation to American meteorologists and climatologists to attend this Congress and to contribute to the program. It is desired to make this Congress as representative of the whole Pacific region as possible, both north and south of the Equator. The Secretary will be glad to receive the names of those who plan to attend, titles of proposed papers, and suggestions as to symposia or other matters that may aid in making the Congress an outstanding success. Papers may be contributed even though the authors cannot attend in person.

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR APRIL 1941

[Climate and Crop Weather Division, J. B. KINCER in charge]

AEROLOGICAL OBSERVATIONS

By EARL C. THOM

Mean surface temperatures for April were above normal over nearly three-fourths of the country (chart I). Temperatures were below normal over western Texas, over most of the Plateau and Rocky Mountain region and, except for the coastal stations, over all of California, while temperatures were above normal over the rest of the country. An area including parts of three States, Arizona, Utah, and Nevada, had mean temperatures slightly more than 4° F. below normal while temperatures in the Great Lakes region were 6° to 8° above normal.

At 1,500 meters above sea level the 5 a. m. resultant winds were from directions to the south of normal over most of the country. The opposite turning from normal was noted, however, over Miami and El Paso, over most of the east central, the northeast and the upper Great Lake areas, as well as over parts of the north-central and northwestern sections. At the 3,000 m. level the directions of the 5 a. m. resultant wind were to the north of normal over most of the northeast and the northwest sections and to the south of normal elsewhere. A comparison could be made between the 5 p. m. resultant winds and the corresponding 5 a. m. normals for only about half of the stations of the country. The stations in the northeast and east-central portions of the country and

most of those in the northwest and west-central areas reported 5 p. m. resultant directions to the north of the corresponding 5 a. m. normals for 5,000 meters while the opposite turning from these normals occurred at this level over the rest of the country.

At both the 1,500 m. and 3,000 m. levels the 5 a. m. resultant wind velocities were generally lower than normal. This negative departure was especially marked in the East Central States where the resultant velocities at these levels were from 4 to 6 m. p. s. below normal. At 5,000 meters most stations in the northern half of the country had 5 p. m. resultant velocities well below the corresponding 5 a. m. normals while the velocities to the south were generally above normal.

Except along the Gulf coast, the extreme Southeast and portions of the Northern Plateau region the 5 p. m. resultant winds were from directions to the south of the corresponding 5 a. m. resultants over the country generally, at the 1,500 m. level. This turning of the resultant winds to the southward during the day was generally true at 3,000 meters, there being only eight stations in the United States where the opposite shift in wind direction occurred.

At 1,500 meters the 5 p. m. resultant velocities were lower than the corresponding 5 a. m. normals over most stations in the eastern two-thirds of the country and were higher generally to the westward. Over the northern third of the country, the velocities of the 5 p. m. resultant winds

at 3,000 meters were lower than corresponding 5 a. m. velocities while an increase in these velocities during the day occurred generally to the southward.

The upper-air data discussed above are based on 5 a. m. (E. S. T.) pilot-balloon observations (charts VIII and IX) as well as on observations made at 5 p. m. (table 2 and charts X and XI).

At radiosonde and airplane stations in the United States proper the highest mean monthly pressure at each of the standard levels from 5,000 to 16,000 meters, inclusive, occurred over Brownsville, Tex. At the levels from 1,500 to 4,000 meters the maximum mean pressure for each level was recorded over two or more stations, while at 17,000 meters the highest mean pressure for the level (92 mb.), occurred over Brownsville, Miami, and San Antonio. At most of the standard levels from 1,500 to 9,000 meters the lowest mean pressure for the month was observed over both Bismarck and Spokane. At five of the standard levels from 10,000 to 15,000 meters the lowest mean pressure was observed over Spokane while at 13,000 meters a mean of 163 mb., the lowest for the level, was reported by both Great Falls and Spokane. At 16,000 meters six northern stations reported the same minimum pressure for the level. At the next level, 17,000 meters, five stations reported mean pressure of 74 mb., the lowest mean value for the level.

At each of the standard levels from 1,500 to 17,000 meters all Alaskan stations recorded pressures lower than the minimum mean pressures for the same levels over the United States while at San Juan pressures at each of the levels from 2,500 to 16,000 meters were higher than the corresponding maxima for the United States.

The mean monthly pressures at levels up to 3,000 meters were generally higher than those of last month over the eastern half of the country and lower than last month to the westward. At 5,000 meters and above, the pressures were higher than last month except that at the levels from 5,000 to 9,000 meters pressures were lower over an area in the Southwest and West Central States. The increase in mean pressures over those of last month was especially marked at the levels from 5,000 to 11,000 meters over the Great Lakes and over the New England States. At Portland, Maine, for example, the average of the mean pressures for these levels was about 16 mb. higher than the corresponding value for March. In Alaska mean pressures for April were either the same or higher than for March at all levels above 11,000 meters.

The largest difference between the maximum and minimum mean monthly pressure at any of the standard levels for stations in the United States was 21 mb. at both 8,000 and 10,000 meters. Steep pressure gradients appear from north to south on the pressure charts, especially at the levels from 7,000 to 11,000 meters. At both the 8,000 and 10,000 meter levels a change of 1 mb. is observed for each 61 miles of horizontal distance between Oklahoma City and Brownsville. This pressure gradient is somewhat steeper than the gradients further to the eastward, a change of 1 mb. in mean pressure, for example, being noted for each 75 miles of horizontal distance between Sault Ste. Marie and Nashville.

Temperatures were generally higher than last month at all levels below 10,000 meters at all stations of the country except at four stations in the Southwest and extreme West where temperatures were slightly lower at several of these levels. At levels above 10,000 meters mean temperatures for April were generally higher than last month in the western half of the country and generally lower to the eastward. At most Alaskan stations the mean temperatures were higher than last month, at Ketchikan however, temperatures were slightly lower at the levels from 5,000

to 9,000 meters but were higher at all other levels.

Comparison of the mean temperature charts for April 1941 with those for 1940 shows that temperatures from the surface to 3,000 meters were higher in April this year than last over the eastern half and over the northern third of the western half of the country and were lower than last year over the rest of the United States. At most levels from 5,000 to 11,000 meters temperatures for the month were higher than last year over the eastern two-thirds of the country and were lower to the westward. At levels above 13,000 meters the mean temperatures were higher than last year at most stations in the western two-thirds of the country and were generally lower to the eastward. At Juneau, Alaska, temperatures were lower than last year at levels below 3,000 meters and were higher than last year at all higher levels. At Fairbanks temperatures were lower than last year at levels up to and including 9,000 meters; were higher at the next four levels; and were lower than last year at 15,000 meters and above.

At the 1,000-meter level the free-air temperatures were higher than normal over most of the country. Temperatures were below normal, however, at this level over California. At 3,000 meters temperatures for the month were above normal over most of the southeast and over most of the northeast and north-central areas, and were below normal over the rest of the country. At 5,000 meters the temperatures were below normal over Denver and over all stations to the westward while, with three exceptions, temperatures were above normal over all stations east of Denver.

At the 1,000-, 3,000- and 5,000-meter levels the relative humidities were above normal over most stations. The mean relative humidities were below normal, however, over Portland, Maine, and Sault Ste. Marie at all three of these levels, while the relative humidity was also below normal at 3,000 meters over Lakehurst and at 1,000 meters over Nashville and Norfolk. There was no clearly defined connection between the April charts for departure from normal relative humidity for these levels and the chart of departure from normal precipitation for the month.

The altitude, at which the monthly mean temperature of 0° C occurred, varied from 1,900 meters (m. s. l.) over Sault Ste. Marie to 4,400 meters over Brownsville. Over the southwest and west-central region the level of average freezing conditions during the month was slightly lower than the corresponding level of last month and was higher over all other stations of the country.

The lowest temperature recorded in the free air over the United States was -79.8° C (-111.6° F) recorded on April 4 at a height of 16,300 meters (about 10 miles) over Miami, Fla. A lower temperature, -87.1° C (-124.8° F) was recorded, however, at 18,200 meters over San Juan on April 3.

Table 3 shows the maximum free air wind velocities and their directions for various sections of the United States during April as determined by pilot-balloon observations. The highest wind velocity reported for the month was 75.0 meters per second (168 m. p. h.) observed over Big Spring, Tex. on April 16. This wind was blowing from the WSW, at an elevation of 10,950 meters.

The highest wind velocities observed in April during the last 5 years occurred this year in the layer from the surface to 2,500 meters and also in the layer from 2,500 m. to 5,000 m. (table 3). A wind of 85.0 m. p. s., the maximum April wind velocity for 5 years, however, was recorded in 1940 for the upper-air layer above 5,000 meters. This wind was recorded on April 22, 1940, blowing from the SW. at a height of 14,670 meters over Redding, Calif.

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during April 1941

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level																							
	Anchorage, Alaska (41 m.)				Albuquerque, N. Mex. (1,620 m.)				Atlantic Station No. 1 ^a (3 m.)				Atlantic Station No. 2 ^a (3 m.)				Atlanta, Ga. (300 m.)				Barrow, Alaska (6 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface	30	998	5.5	63	29	835	8.4	53	27	1015	14.8	73	30	1017	14.8	82	30	983	14.3	76	30	1,020	-17.3	91
500	30	943	3.3	67	—	—	—	—	27	901	10.6	77	30	958	10.8	87	30	960	15.7	69	30	955	-16.5	83
1,000	30	887	-0.3	68	—	—	—	—	27	957	7.5	77	30	902	7.8	87	30	906	13.7	64	30	894	-13.2	73
1,500	30	832	-4.3	72	—	—	—	—	27	848	5.2	72	30	849	6.6	77	30	853	10.4	63	30	836	-12.6	66
2,000	30	781	-8.2	77	29	797	6.3	53	27	797	3.0	68	30	799	4.3	70	30	803	7.7	59	30	783	-13.5	62
2,500	30	732	-11.6	78	29	749	2.8	55	27	749	2.7	63	30	751	2.2	63	30	755	4.9	58	30	733	-15.8	61
3,000	30	686	-14.9	78	29	704	-1.2	56	27	703	-1.8	55	30	705	-5.5	57	30	710	2.4	54	30	686	-18.3	60
4,000	30	600	-21.7	77	28	620	-8.3	62	26	619	-8.0	49	30	622	-6.3	50	30	627	-3.5	49	30	599	-24.3	57
5,000	30	523	-28.5	76	27	544	-15.3	60	26	543	-14.7	45	30	546	-12.6	45	30	551	-10.1	44	30	521	-30.7	56
6,000	30	454	-35.2	75	27	476	-21.9	56	26	475	-21.8	43	28	478	-19.6	44	30	484	-16.9	40	30	452	-37.7	55
7,000	30	392	-42.2	—	26	414	-28.7	53	26	414	-29.1	42	28	418	-26.5	44	29	422	-23.7	39	30	390	-44.7	—
8,000	30	338	-48.3	—	26	359	-35.7	49	26	359	-36.3	43	26	362	-33.9	44	29	367	-31.2	37	30	335	-50.5	—
9,000	30	290	-52.2	—	26	310	-42.6	—	26	310	-42.7	—	26	313	-41.3	—	29	318	-38.4	36	30	287	-53.3	—
10,000	30	248	-52.3	—	24	267	-48.9	—	24	267	-48.7	—	24	270	-48.7	—	29	275	-45.6	—	29	246	-51.2	—
11,000	30	213	-50.7	—	23	229	-53.3	—	24	228	-53.0	—	26	231	-55.1	—	29	236	-52.0	—	28	211	-48.8	—
12,000	30	182	-49.2	—	23	196	-55.5	—	24	195	-55.8	—	26	197	-58.9	—	29	202	-56.9	—	25	182	-47.6	—
13,000	29	157	-48.7	—	22	167	-56.4	—	24	167	-56.4	—	26	168	-58.8	—	26	172	-58.8	—	23	156	-47.7	—
14,000	28	134	-48.8	—	22	143	-56.2	—	23	142	-55.4	—	26	143	-57.5	—	26	147	-59.7	—	21	134	-48.2	—
15,000	27	116	-49.2	—	22	122	-57.2	—	22	122	-55.6	—	25	122	-58.3	—	24	125	-61.2	—	20	115	-48.7	—
16,000	24	99	-49.6	—	22	104	-58.4	—	21	104	-56.6	—	24	104	-59.8	—	24	106	-63.1	—	18	99	-49.1	—
17,000	24	85	-50.2	—	21	89	-59.8	—	19	88	-56.9	—	22	89	-59.7	—	21	90	-63.2	—	11	85	-49.3	—
18,000	18	73	-50.9	—	18	75	-59.8	—	14	76	-56.8	—	17	76	-59.6	—	19	77	-62.7	—	7	73	-49.9	—
19,000	13	62	-51.5	—	11	64	-58.9	—	10	64	-56.6	—	8	64	-59.1	—	13	65	-61.9	—	5	62	-50.3	—
20,000	5	54	-52.3	—	7	64	-57.0	—	9	66	-65.6	—	5	54	-57.8	—	14	55	-61.7	—	5	46	-59.7	—

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level																							
	Bethel, Alaska (7 m.)				Bismarck, N. Dak. (505 m.)				Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Charleston, S. C. (14 m.)				Coco Solo, C. Z. ¹ (15 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface	28	999	0.9	81	30	955	5.6	84	30	1,011	20.6	92	30	993	6.5	76	30	1,017	15.2	87	25	1,012	26.9	87
500	28	940	-7	77	30	899	5.2	77	30	901	19.4	86	30	960	8.7	69	30	960	16.3	68	25	957	24.3	90
1,000	28	883	-3.1	78	30	845	3.0	76	30	850	18.5	73	30	903	6.6	63	30	905	13.5	67	25	903	21.5	81
1,500	28	828	-6.1	80	30	845	0.5	77	30	820	15.0	59	30	798	3.9	59	30	853	10.6	66	25	852	18.7	77
2,000	28	777	-9.1	78	30	794	0.5	77	30	755	12.6	53	30	750	-0.8	56	30	755	5.3	68	25	804	16.1	72
2,500	28	728	-12	75	30	746	-2.3	78	30	740	11.1	50	29	744	-15.8	48	30	627	-3.4	47	17	633	13.7	64
3,000	28	682	-15.3	73	30	701	-5.4	75	30	712	10.1	50	29	704	-3.4	53	30	710	2.4	51	25	714	11.4	50
4,000	28	596	-22.0	68	30	616	-11.8	65	28	630	3.5	48	29	620	-9.3	48	30	627	-3.4	47	17	633	5.2	49
5,000	27	520	-28.8	61	30	540	-18.6	60	28	556	-3.8	49	29	544	-15.8	45	30	552	-9.5	45	—	—	—	—
6,000	27	451	-36.0	59	30	471	-25.4	57	28	490	-11.3	50	29	475	-22.6	43	30	484	-15.9	41	—	—	—	—
7,000	27	389	-43.0	—	30	409	-32.4	54	27	429	-18.4	49	29	414	-29.8	42	30	423	-22.3	40	—	—	—	—
8,000	27	335	-48.3	—	30	364	-39.9	50	27	375	-25.6	47	29	359	-37.8	40	30	369	-28.9	38	—	—	—	—
9,000	27	288	-51.7	—	30	305	-47.4	—	27	325	-32.8	46	29	310	-45.3	—	30	319	-38.0	38	—	—	—	—
10,000	27	246	-50.5	—	29	262	-53.6	—	26	282	-40.0	—	29	266	-52.0	—	30	276	-45.0	—	—	—	—	—
11,000	27	212	-48.1	—	28	225	-56.5	—	25	243	-46.9	—	29	228	-57.2	—	30	237	-53.1	—	—	—	—	—
12,000	27	182	-47.1	—	28	192	-55.6	—	24	208	-53.2	—	29	194	-58.8	—	30	202	-57.7	—	—	—	—	—
13,000	25	156	-47.4	—	28	164	-54.0	—	24	178	-58.9	—	29	166	-58.2	—	30	173	-60.0	—	—	—	—	—
14,000	23	134	-47.6	—	28	140	-53.5	—	24	152	-63.4	—	28	142	-66.9	—	30	147	-61.1	—	—	—	—	—
15,000	23	116	-																					

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during April 1941—Continued

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level																																		
	Denver, Colo. (1,616 m.)					El Paso, Tex. (1,193 m.)					Ely, Nev. (1,908 m.)					Fairbanks, Alaska (156 m.)					Great Falls, Mont. (1,128 m.)					Joliet, Ill. (178 m.)					Juneau, Alaska (49 m.)				
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity							
Surface	30	834	4.9	76	30	879	13.9	40	30	805	0.6	82	30	985	4.4	53	30	885	6.1	63	27	996	7.9	81	30	1,006	6.2	85							
500																																			
1,000																																			
1,500																																			
2,000	30	795	3.8	73	30	798	10.3	40	30	796	1.5	78	30	782	-6.7	62	30	795	2.2	60	27	797	2.3	70	28	789	-5.4	82							
2,500	30	748	0.7	71	30	751	6.4	41	30	748	-0.7	73	30	733	-10.4	63	30	747	-1.6	62	27	749	-0.6	68	27	740	-8.2	81							
3,000	30	702	-2.8	72	30	706	2.8	40	30	703	-4.4	72	30	687	-13.8	64	30	701	-5.2	66	27	704	-3.1	64	24	693	-10.9	77							
4,000	30	618	-9.6	72	29	624	-4.4	43	30	618	-11.7	71	30	601	-20.8	64	30	617	-11.5	68	28	620	-8.8	57	20	608	-16.9	69							
5,000	29	542	-16.7	70	29	548	-11.1	43	30	542	-18.8	66	30	525	-27.7	62	30	541	-18.0	64	26	544	-15.2	49	18	531	-22.8	63							
6,000	27	474	-24.1	64	29	481	-18.0	38	30	473	-26.0	62	30	456	-34.8	62	30	472	-25.0	60	26	476	-22.1	46	17	462	-29.5	63							
7,000	27	412	-31.6	60	29	420	-24.9	35	30	410	-33.6	60	30	394	-41.6	62	30	410	-32.4	57	26	414	-29.1	44	14	400	-36.4	44							
8,000	27	357	-39.7	58	29	365	-32.4	33	30	355	-41.2	62	30	340	-47.9	62	30	355	-40.5	54	26	360	-36.7	13	12	344	-43.2	44							
9,000	26	308	-47.1	57	29	316	-40.1	30	306	-47.8	62	28	291	-52.6	62	30	306	-48.5	52	25	310	-44.1	12	10	296	-49.2	42								
10,000	26	264	-52.5	57	27	273	-47.5	30	26	262	-52.8	62	27	249	-52.7	62	30	263	-56.0	54	25	267	-51.1	10	217	-51.0	44								
11,000	25	226	-54.6	57	27	234	-53.8	30	225	-55.0	62	26	214	-50.7	62	30	224	-59.4	54	25	229	-56.2	10	217	-51.0	44									
12,000	23	193	-55.4	57	27	200	-57.6	30	192	-54.4	62	26	183	-49.1	62	30	191	-56.8	52	25	195	-57.8	7	185	-51.4	44									
13,000	22	165	-54.6	56	26	170	-58.0	29	164	-53.2	62	24	157	-48.5	62	26	163	-54.2	52	25	166	-56.4	6	168	-48.8	44									
14,000	19	141	-54.4	56	26	145	-58.8	29	141	-53.5	62	23	135	-48.5	62	28	140	-53.9	52	25	142	-55.5	5	136	-47.6	44									
15,000	18	120	-54.8	56	26	124	-60.5	28	120	-54.9	62	22	116	-49.0	62	28	120	-53.8	52	24	122	-55.3	5	117	-48.8	44									
16,000	15	103	-55.8	56	26	105	-63.3	28	103	-55.8	62	20	99	-49.6	62	27	102	-54.3	52	22	104	-55.9	5	100	-48.4	44									
17,000	14	88	-56.2	56	24	89	-63.6	23	88	-56.6	62	15	85	-50.2	62	24	85	-54.7	52	20	89	-56.3	5	86	-47.5	44									
18,000	10	75	-55.9	56	21	76	-62.7	15	75	-56.4	62	12	73	-50.8	62	17	75	-54.9	52	14	76	-56.5	5	74	-46.8	44									
19,000	6	86	-53.1	56	7	74	-58.8	13	74	-55.3	62	5	63	-55.1	62	17	65	-65.3	14	65	-60.4	6	62	-56.1	5	63	-47.6	44							
20,000																																			
21,000																																			

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level																																		
	Ketchikan, Alaska (26 m.)					Lakehurst, N. J. ¹ (39 m.)					Medford, Oreg. (401 m.)					Miami, Fla. (4 m.)					Nashville, Tenn. (180 m.)					Nome, Alaska (14 m.)					Norfolk, Va. ¹ (10 m.)				
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity							
Surface	27	1,011	8.1	75	30	1,014	7.0	79	29	967	9.6	70	28	1,016	20.0	85	30	996	14.7	71	30	1,003	-1.8	72	21	1,020	12.8	80							
500	27	954	5.9	75	30	959	9.1	66	29	955	10.8	69	28	960	18.3	84	30	959	15.3	66	30	944	-3.3	73	21	962	15.8	53							
1,000	27	898	2.5	75	30	903	7.3	64	29	899	8.3	67	28	905	16.0	72	30	904	12.5	66	30	886	-5.2	72	31	907	12.8	48							
1,500	27	844	-0.8	76	30	850	4.7	62	29	846	4.8	70	28	854	13.3	67	30	852	9.2	68	30	831	-7.2	70	21	854	9.5	49							
2,000	27	792	-3.5	71	30	799	2.1	61	29	795	1.3	71	28	803	10.6	64	30	802	6.1	68	30	779	-9.8	67	21	804	6.3	52							
2,500	27	743	-6.1	65	30	750	-0.6	59	29	747	-1.9	71	28	757	8.5	54	30	754	3.8	62	30	730	-12.8	55	21	756	2.8	55							
3,000	27	697	-9.1	60	30	705	-3.1	55	29	701	-5.1	68	28	712	6.3	56	30	709	1.2	60	30	683	-16.2	63	21	711	0.0	50							
4,000	27	611	-15.3	58	30	620	-8.6	51	29	617	-11.1	60	28	630	0.8	39	30	626	-4.8	54	29	597	-22.7	59	21	626	-5.5	41							
5,000	27	535	-21.9	58	30	544	-14.8	56	29	541	-18.5	56	27	555	-5.2	40	30	550	-11.3	49	29	520	-29.4	54	17	550	-36.7	54							
6,000	27	466	-28.8	52	29	476	-21.3	59	29	472	-25.8	54	26	488	-12.1	40	30	482	-18.1	48	29	451	-36.7	54	17	450	-49.4	54							
7,000	25	404	-36.0	51	29	415	-28.6	60	29	412	-33.5	54	26	373	-26.1	40	29	366	-32.5	45	29	335	-49.4	54	17	335	-49.4	54							
8,000	23	349	-43.6	57	29	360	-36.3	59	29	355	-41.0	54	26	373	-33.5	40	28	317	-40.0	46	28	298</													

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during April 1941—Continued

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level																											
	Oakland, Calif. (2 m.)				Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (301 m.)				Pearl Harbor, T. H. ^{1,2} (7 m.)				Pensacola, Fla. ^{1,3} (24 m.)				Phoenix, Ariz. (339 m.)							
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity				
Surface	30	1,015	12.0	80	30	968	13.7	78	30	979	11.1	74	30	1,017	20.5	81	28	1,016	19.0	83	30	972	13.6	70	30	1,015	5.2	72
500	30	958	9.8	77	30	956	14.6	75	30	956	10.7	73	30	961	19.3	74	28	1,016	17.2	74	30	954	17.2	55	30	957	5.7	58
1,000	30	900	8.6	64	30	901	13.2	66	30	900	9.0	71	30	907	16.3	73	28	906	15.1	69	30	899	14.4	49	30	900	4.9	58
1,500	30	847	5.7	53	30	848	10.6	64	30	847	7.2	65	30	855	13.5	74	28	854	12.4	63	30	847	10.4	49	30	847	2.0	59
2,000	30	797	2.7	52	30	790	7.6	62	30	797	4.2	63	30	806	11.7	63	28	804	9.9	56	30	797	6.4	51	30	796	0.0	56
2,500	30	748	-0.6	49	30	751	5.0	57	30	749	1.1	62	30	758	11.2	39	28	756	7.6	50	30	749	2.7	51	30	747	-2.5	53
3,000	30	702	-3.8	48	30	706	1.8	55	30	704	-1.6	60	30	714	10.2	27	27	712	5.1	44	30	704	-1.0	51	30	701	-5.0	52
4,000	30	618	-10.3	44	30	623	-4.5	52	30	620	-8.0	57	30	632	6.0	17	27	629	-0.8	42	30	621	-7.9	52	30	617	-10.4	53
5,000	30	542	-16.9	42	30	548	-11.3	47	28	544	-14.9	54	24	554	-7.2	47	30	545	-14.0	49	30	541	-18.6	49	28	543	-16.6	49
6,000	30	473	-24.3	41	30	480	-18.2	42	27	476	-21.9	51	19	486	-13.7	46	30	477	-20.5	47	30	473	-22.7	47	28	473	-22.7	47
7,000	30	412	-31.6	40	30	419	-25.9	41	27	415	-29.3	49	18	425	-21.2	46	29	416	-27.7	46	30	412	-30.4	45	28	412	-30.4	45
8,000	30	357	-38.5	39	29	364	-33.4	40	27	360	-37.2	49	15	370	-28.7	45	29	361	-35.0	45	29	357	-38.3	46	28	357	-38.3	46
9,000	30	308	-44.9	29	315	-41.1	---	27	310	-44.8	---	14	321	-36.1	---	29	312	-42.0	---	28	308	-46.3	---	28	308	-46.3	---	
10,000	30	265	-50.7	29	271	-48.1	---	27	267	-51.5	---	12	277	-43.8	---	28	269	-48.3	---	28	264	-53.6	---	28	264	-53.6	---	
11,000	27	226	-54.1	29	233	-53.8	---	26	228	-56.1	---	8	238	-51.7	---	28	231	-52.9	---	28	226	-57.6	---	28	226	-57.6	---	
12,000	26	194	-55.0	29	199	-57.5	---	26	195	-58.2	---	8	203	-58.8	---	27	197	-55.1	---	28	193	-57.3	---	28	193	-57.3	---	
13,000	23	166	-54.5	29	170	-57.9	---	24	166	-57.8	---	6	172	-64.4	---	25	169	-64.3	---	28	164	-56.9	---	28	164	-56.9	---	
14,000	23	142	-54.4	28	145	-58.3	---	24	142	-56.8	---	5	145	-67.3	---	24	144	-55.1	---	24	140	-56.1	---	24	140	-56.1	---	
15,000	20	121	-55.1	28	123	-59.5	---	23	121	-57.1	---	22	123	-57.3	---	22	120	-56.7	---	22	120	-56.7	---	22	120	-56.7	---	
16,000	18	103	-55.7	26	105	-60.7	---	19	103	-57.9	---	20	105	-50.2	---	19	99	-59.7	---	19	102	-58.1	---	19	102	-58.1	---	
17,000	15	88	-56.0	23	89	-61.5	---	16	88	-58.3	---	15	76	-59.7	---	15	76	-59.7	---	10	74	-57.9	---	12	87	-58.1	---	
18,000	17	89	-55.6	19	76	-61.4	---	12	75	-57.9	---	11	78	-59.7	---	10	74	-57.9	---	17	87	-55.9	---	17	87	-55.9	---	
19,000	13	76	-59.3	8	76	-56.7	---	9	64	-58.0	---	9	64	-59.3	---	5	64	-59.3	---	10	74	-56.2	---	10	74	-56.2	---	
20,000	7	64	-59.2	6	65	-56.8	---	5	55	-55.3	---	6	56	-62.2	---	6	56	-61.3	---	6	56	-61.3	---	6	56	-61.3	---	

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level																											
	St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)				St. Thomas, V. I. ^{1,2} (8 m.)				San Antonio, Tex. (174 m.)				San Diego, Calif. ^{1,3} (19 m.)				San Juan, P. R. (15 m.)							
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity				
Surface	30	996	12.9	76	30	989	9.2	77	26	1,016	26.9	71	30	993	17.8	84	28	1,012	15.5	79	26	1,013	24.3	81	30	992	3.9	78
500	30	958	12.3	75	30	956	9.2	74	26	961	22.8	91	30	956	17.6	82	28	955	12.0	74	26	958	22.0	81	30	959	5.7	74
1,000	30	902	10.0	72	30	900	7.2	73	26	907	19.4	84	30	902	15.7	77	28	904	9.4	66	26	905	18.7	80	30	902	4.0	67
1,500	30	849	7.1	70	30	847	4.7	74	26	856	16.4	79	30	850	14.0	69	28	847	7.2	57	26	853	15.7	77	30	848	1.7	64
2,000	30	799	4.3	67	30	796	2.2	70	26	806	14.9	65	30	801	11.7	62	28	797	4.2	50	26	804	13.8	68	30	797	-0.2	62
2,500	30	751	1.2	63	30	748	-0.5	68	26	760	13.7	52	30	754	9.3	57	28	749	0.9	51	26	758	11.9	58	30	748	-2.7	60
3,000	30	705	-1.8	61	30	702	-3.2	63	26	716	11.4	45	30	710	6.9	51	27	703	-2.3	54	26	713	9.4	49	30	702	-5.2	55
4,000	30	621	-7.7	57	30	618	-9.1	56	26	635	5.8	44	30	628	0.6	45	26	619	-7.7	48	26	632	4.0	43	29	617	-10.8	43
5,000	29	546	-14.0	56	30	543	-15.8	53	28	554	-6.1	39	25	544	-13.4	37	28	558	-1.7	37	29	541	-17.1	43	28	541	-17.1	43
6,000	28	478	-20.8	53	30	474	-22.8	49	28	486	-13.2	36	25	476	-20.2	39	26	492	-7.9	32	29	473	-24.1	42	28	473	-24.1	42
7,000	27	416	-28.1	50	30	413	-29.9	48	28	426	-20.7	35	25	415	-28.0	38	28	428	-14.5	29	29	411	-31.7	41	28	411	-31.7	41
8,000	26	361	-35.7	48	30	353	-37.6	47	28	371	-27.7	34	24	360	-35.2	32	25	377	-21.4	28	28	356	-39.6	40	28	356	-39.6	40
9,000	26	312	-43.2	29	309	-45.0	28	28	322	-36.5	34	24	311	-41.8	32	25	328	-28.3	28	28	307	-47.2	28	28</				

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during April 1941—Continued

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level												Late report for March 1941			
	Seattle, Wash. ¹ (27 m.)				Spokane, Wash. (598 m.)				Washington, D. C. (5 m.)				Swan Island, W. I. (10 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	29	1,012	10.5	77	30	942	8.5	71	29	1,018	12.2	68	31	1,013	24.8	76
500	29	956	9.7	69	30	898	9.1	62	29	960	12.8	62	31	958	21.1	83
1,000	29	900	6.7	67	30	845	5.7	60	29	904	10.5	60	31	904	18.0	79
1,500	28	847	3.3	68	30	796	-0.1	70	30	851	7.5	58	31	853	15.7	68
2,000	28	796	-3.1	67	30	746	-1.8	61	29	801	4.6	58	31	804	14.0	60
2,500	28	747	-6.1	66	30	701	-5.5	64	29	753	-1.7	59	31	757	11.9	56
3,000	28	701	-12.5	63	30	616	-12.7	66	28	707	-1.1	61	31	713	9.8	50
4,000	28	616	-19.3	65	30	539	-19.3	62	27	628	-6.9	56	31	632	5.6	40
5,000	28	540	-26.7	63	30	471	-26.1	57	26	479	-20.4	51	31	559	-0.2	34
6,000	28	471	-33.6	61	30	409	-33.7	54	25	418	-27.6	49	31	492	-6.7	29
7,000	28	410	-41.2	59	29	354	-41.5	54	24	362	-35.3	47	31	378	-19.8	27
8,000	28	355	-48.4	56	29	305	-49.1	53	23	313	-43.2	51	31	329	-27.4	26
9,000	28	306	-55.6	54	29	261	-55.8	50	21	289	-50.5	51	31	287	-34.6	25
10,000	27	262	-64.6	52	29	210	-64.6	48	20	230	-55.6	52	29	248	-42.5	24
11,000	27	224	-59.1	50	29	193	-58.4	46	20	197	-57.5	52	29	213	-50.6	23
12,000	26	192	-59.3	48	29	163	-54.7	44	19	168	-56.8	49	29	182	-58.6	22
13,000	26	164	-57.5	46	29	139	-53.9	42	18	143	-52.2	45	25	155	-66.2	21
14,000	24	140	-56.2	44	29	120	-55.5	40	16	122	-57.0	44	24	131	-73.3	20
15,000	22	120	-55.6	42	28	102	-54.4	38	14	104	-57.6	42	24	110	-79.9	19
16,000	20	102	-55.6	27	27	87	-54.6	36	10	89	-58.4	33	23	92	-82.6	18
17,000	14	87	-55.6	22	22	74	-54.6	34	10	76	-58.2	31	20	77	-78.5	17
18,000	10	74	-55.7	14	14	64	-54.8	30	5	65	-58.3	29	15	65	-73.0	16
19,000	6	62	-56.0	11	11								11	54	-68.4	15
20,000													7	46	-64.5	14
21,000													5	39	-59.9	13
22,000																

¹ U. S. Navy.

* Airplane observations.

Observations made on Coast Guard vessels in or near the 5° square:
Lat. 35°00' N. to 40°00' N.
Long. 55°00' W. to 60°00' W.Observations made on Coast Guard vessels in or near the 5° square:
Lat. 35°00' N. to 40°00' N.
Long. 45°00' W. to 50°00' W.

Radiosonde and airplane observations.

NOTE.—All observations taken at 12:30 a. m. 75th meridian time, except at Lakehurst, N. J., where they are taken at or near 5 a. m., E. S. T., at Norfolk, Va., where they are taken at about 6 a. m., and at Pearl Harbor, T. H., after sunrise.

None of the means included in this table are based on less than 15 surface or 5 standard level observations.

Number of observations refers to pressure only as temperature and humidity data are missing for some observations at certain levels; also, the humidity data are not used in daily observations when the temperature is below -40.0° C.

TABLE 2.—Free-air resultant winds based on pilot-balloon observations made ear 5 p. m. (75th meridian time) during April 1941. Directions given in degrees from North ($N=360^{\circ}$, $E=90^{\circ}$, $S=180^{\circ}$, $W=270^{\circ}$)—Velocities in meters per second

Altitude (meters) m. s. l.	Abilene, Tex. (537 m.)	Albuquerque, N. Mex. (1,630 m.)	Atlanta, Ga. (299 m.)	Billings, Mont. (1,095 m.)	Bismarck, N. Dak. (512 m.)	Boise, Idaho (866 m.)	Brownsville, Tex. (7 m.)	Buffalo, N. Y. (220 m.)	Burlington, Vt. (132 m.)	Charleston, S. C. (18 m.)	Chicago, Ill. (192 m.)	Cincinnati, Ohio (152 m.)	Denver, Colo. (1,627 m.)			
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	
Surface	28	176	3.2	30	226	2.2	30	196	0.5	29	121	4.4	30	278	1.0	
500	28	188	4.0	30	224	1.4	28	232	0.8	28	132	5.2	30	315	2.1	
1,000	28	201	4.0	28	243	1.7	29	242	2.8	28	233	2.3	28	280	2.2	
1,500	27	216	3.8	25	246	4.5	24	237	2.9	29	210	4.2	28	234	3.7	
2,000	23	216	3.8	30	256	4.5	24	246	2.7	29	231	2.1	25	294	5.6	
2,500	18	235	7.8	30	256	4.5	24	328	1.4	19	218	4.5	26	284	3.7	
3,000	17	244	10.3	29	238	5.7	22	254	4.0	23	290	2.5	10	242	5.1	
4,000	16	248	15.6	24	252	9.6	20	274	7.1	21	302	2.8	15	21	1.4	
5,000	13	256	19.3	18	250	14.1	15	274	8.8	18	311	3.9	15	18	3.9	
6,000	13	261	22.6	15	251	17.1	12	278	12.2	16	353	3.3	16	329	9.7	
8,000	10	263	24.1	10	292	15.2	12	331	6.1	12	341	3.6	13	311	12.0	
10,000											12	338	5.5	10	338	13.5

Altitude (meters) m. s. l.	El Paso, Tex. (1,190 m.)	Ely, Nev. (1,910 m.)	Grand Junction, Colo. (1,413 m.)	Greensboro, N. C. (271 m.)	Havre, Mont. (767 m.)	Jacksonville, Fla. (14 m.)	Las Vegas, Nev. (670 m.)	Little Rock, Ark. (79 m.)	Medford, Oreg. (410 m.)	Miami, Fla. (10 m.)	Minneapolis, Minn. (265 m.)	Mobile, Ala. (9 m.)	Nashville, Tenn. (194 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	29	259	3.2	29	288	0.8	30	262	1.1	28	86	2.2	30	160	1.8
500	29	253	3.1	30	258	1.2	25	247	2.0	28	101	2.5	29	149	3.4
1,000	29	246	4.1	29	297	0.9	30	271	1.6	24	253	2.6	27	203	1.4
1,500	28	252	6.7	29	266	1.1	29	258	1.8	24	348	2.4	27	250	1.9
2,000	28	252	8.7	27	252	1.3	29	219	1.0	27	265	2.4	27	213	5.6
2,500	26	251	8.2	27	252	1.3	29	202	5.3	23	348	2.4	27	225	6.6
3,000	22	246	18.2	18	249	1.5	19	215	3.9	21	297	2.7	22	257	5.5
4,000	17	244	18.8	11	187	3.8	11	258	4.6	19	266	7.9	17	297	9.9
5,000	12	249	24.1	12	317	8.5	12	297	9.0	17	331	3.0	19	285	12.0
8,000										14	286	18.5	17	293	20.4
10,000										14	289	22.3	14	293	15.7
12,000										11	279	18.0	11	282	12.6

TABLE 2.—Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th, meridian time) during April 1941. Directions given in degrees from North ($N=360^\circ$, $E=90^\circ$, $S=180^\circ$, $W=270^\circ$)—Velocities in meters per second—Continued

Altitude (meters) m. s. l.	New York, N. Y. (15 m.)	Oakland, Calif. (8 m.)	Oklahoma City, Okla. (402 m.)	Omaha, Nebr. (306 m.)	Phoenix, Ariz. (338 m.)	Rapid City, S. Dak. (982 m.)	St. Louis, Mo. (181 m.)	San Antonio, Tex. (180 m.)	San Diego, Calif. (15 m.)	Sault Ste. Marie, Mich. (230 m.)	Seattle, Wash. (14 m.)	Spokane, Wash. (603 m.)	Washington, D. C. (10 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	28 233 1.0 29 243 3.8 27 159 2.3 26 178 2.5 20 263 1.7 28 338 2.9 26 147 0.8 27 104 2.7 27 277 4.3 28 232 1.9 29 271 1.5 29 216 0.9 29 237 0.8														
500	28 260 3.1 29 266 2.8 27 173 2.7 26 190 2.8 30 244 2.8 28 339 2.9 26 216 3.3 27 110 3.9 27 290 3.6 28 235 1.5 29 260 1.7 29 300 1.0														
1,000	28 286 4.5 28 296 2.4 27 166 4.7 25 187 5.3 30 233 3.6 28 339 2.9 26 216 3.3 27 118 2.7 27 294 2.5 28 232 2.1 29 212 1.9 28 242 2.4 29 223 0.9 29 283 1.8														
1,500	28 306 6.4 24 321 2.7 27 187 4.6 30 201 6.9 30 240 4.2 28 328 2.9 23 218 4.9 18 176 1.6 17 288 3.3 23 241 2.4 28 212 3.1 29 291 1.0 28 276 3.3														
2,000	24 315 8.4 23 325 3.0 26 223 5.1 21 221 6.2 30 240 4.5 24 272 1.5 21 236 4.7 14 262 3.6 16 290 3.5 23 226 2.2 23 190 4.2 23 210 1.5 27 287 5.4														
2,500	23 318 8.1 23 325 2.8 23 243 7.1 19 223 7.6 29 252 3.5 18 241 4.1 21 242 5.1 12 264 5.6 15 300 4.5 21 261 2.6 22 181 4.3 23 233 0.8 26 288 7.1														
3,000	20 316 9.2 22 316 3.9 20 249 9.7 15 235 7.6 28 260 4.7 14 220 5.6 17 244 5.9 14 311 5.3 19 286 3.8 19 174 4.9 22 160 0.1 24 249 8.9														
4,000	21 328 5.4 15 253 11.8 11 235 5.7 22 260 8.4 12 223 6.8 17 256 7.6 14 278 10.0 14 281 12.8 13 261 2.2 15 156 2.5 19 172 1.9 20 307 10.4														
5,000	20 326 7.7 10 232 14.4 11 241 6.8 21 265 13.2 10 226 9.7 14 278 10.0 16 270 15.7 13 261 12.8 15 281 7.5 11 358 3.9 16 96 1.3 16 322 9.5														
6,000	17 331 10.5 ----- 16 270 15.7 ----- 13 261 12.8 ----- 15 281 7.5 11 358 3.9 16 96 1.3 16 322 9.5														
8,000	14 341 18.6 ----- 10 280 28.7 ----- 10 282 19.0 ----- 11 343 1.4 ----- 10 275 3.2 -----														
10,000	-----														
12,000	-----														

TABLE 3.—Maximum free air wind velocities, (m. p. s.), for different sections of the United States, based on pilot-balloon observations during April 1941

Section	Surface to 2,500 meters (m. s. l.)					Between 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast 1	41.0	WNW	2,460	14	Pittsburgh, Pa.	60.4	W	4,240	22	Boston, Mass.	65.0	WSW	10,300	1	Portland, Maine.
East-Central 2	37.0	WSW	2,230	20	Louisville, Ky.	45.0	WSW	3,930	21	Elkins, W. Va.	54.0	NW	10,300	26	Louisville, Ky.
Southeast 3	28.9	ESE	1,000	7	Birmingham, Ala.	38.0	WSW	3,700	4	Mobile, Ala.	67.0	WNW	10,150	1	Jacksonville, Fla.
North-Central 4	39.8	SSW	2,110	20	Milwaukee, Wis.	31.9	WSW	2,870	11	Rapid City, S. Dak.	46.8	SW	9,440	12	Rapid City, S. Dak.
Central 5	57.6	SSW	1,100	13	Des Moines, Iowa	45.6	S	4,470	13	Dodge City, Kans.	61.6	WSW	10,140	20	Wichita, Kans.
South-Central 6	37.0	W	1,390	6	Big Spring, Tex.	53.6	S	4,210	19	Dallas, Tex.	75.0	WSW	10,950	16	Big Spring, Tex.
Northwest 7	36.8	E	260	4	Tacoma, Wash.	34.0	N	4,650	13	Spokane, Wash.	50.0	NW	10,690	7	Medford, Oreg.
West-Central 8	36.0	W	2,480	13	Cheyenne, Wyo.	39.1	SW	2,840	14	Winnemucca, Nev.	68.0	NW	13,590	7	Redding, Calif.
Southwest 9	36.6	NW	2,500	6	Albuquerque, N. Mex.	45.4	NW	2,780	6	Albuquerque, N. Mex.	69.9	WNW	10,420	6	Las Vegas, Nev.

¹ Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and Northern Ohio.

² Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.

³ South Carolina, Georgia, Florida, and Alabama.

⁴ Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.

⁵ Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.

⁶ Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except extreme west Texas), and western Tennessee.

⁷ Montana, Idaho, Washington, and Oregon.

⁸ Wyoming, Colorado, Utah, northern Nevada, and northern California.

⁹ Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

WEATHER ON THE NORTH ATLANTIC OCEAN

By H. C. HUNTER

Atmospheric pressure.—During April 1941, the portions of the North Atlantic Ocean which are well covered by reports at hand had pressure mostly below normal, as has been the case during each month of 1941 so far. The deficiency was greatest, on the average, over the southeastern part of the ocean. Near the North American coast, from the Gulf of St. Lawrence to the waters east of the Carolinas, the pressure averaged somewhat above normal.

The extremes of pressure in available vessel reports were 1,036.2 and 988.8 millibars (30.60 and 29.20 inches). The high mark was noted late on the 24th by the Coast Guard cutter *Bibb*, near 38° N., 44° W. Pressure had been almost as high over waters adjacent to southern New England, the Middle Atlantic States, and the Carolinas during the 13th and the latter part of the 12th. The low reading was reported by the American steamship *Carrillo*, about midnight of the 1st-2d, near 37½° N., 71° W. Marks closely approaching the *Carrillo*'s were noted during the final 2 days of the month near the coast of Portugal.

Cyclones and gales.—The month seems to have been about as stormy as an average April, but the especially high winds were limited to the early and late portions of the month almost exclusively, the period from the 9th to

TABLE 1.—Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, April 1941

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
Lisbon, Portugal	Millibars	Millibars	Millibars	Millibars	Millibars	Millibars
1,012.4	-3.2	1,023	6	998	29	
1,019.0	-2.0	1,028	10,25	1,006	6	
1,010.9	-1.3	1,030	25,27	986	1	
1,017.0	+3.5	1,032	26	1,003	1	
1,017.3	+2.4	1,032	12	1,001	6	
1,018.3	+2.0	1,029	13	1,000	1	
1,016.1	-0.5	1,021	16	1,008	30	
1,015.6	-1.0	1,024	14	1,008	5	
1,015.9	0.0	1,025	14	1,002	3	

NOTE.—All data based on available observations, departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Two portions of the month as already noted had particularly low pressure readings—the first 2 and the final 2 days. However, the only known occurrences of winds of force greater than 10 were connected with neither of these, but occurred during the daylight hours of the 5th over waters to eastward of the Carolinas, as shown in the table of gales accompanying. The low connected with these winds was centered over Indiana on the morning of the 5th, but was of wide extent, its

eastern edge covering waters somewhat to eastward of the coast from New Jersey to below Hatteras. On the following morning the center was about 100 miles to southward of Nantucket, whence it moved rapidly onward toward the east-northeast.

Fog.—As the spring advances there is normally a marked increase in amount of fog reported, and this year the increase from March to April was very noteworthy, especially over the northern Gulf of Mexico and near the United States coast between Capes Hatteras and Cod. The portion of the gulf where fog was most frequent was the square 25° to 30° N., 85° to 90° W., with 8 days of occurrence, none of these being later than the 21st.

The western North Atlantic square with most days of

fog was that from 35° to 40° N., 70° to 75° W., where the count was 12, distributed through the month. Well to the southward, between the Bahamas and Bermuda, some fog was seen on the 18th and 19th; over these waters fog is of rare occurrence.

Fog was noted on several dates, especially about the middle of the month, nearly midway between Bermuda and the western Azores, while a few occurrences were reported between the Azores and Portugal.

In comparison with the Aprils of past years April of 1941 is found to have had very much more than normal fogginess over the northern Gulf of Mexico and somewhat more than normal over waters adjacent to the Middle Atlantic States.

OCEAN GALES AND STORMS, APRIL 1941

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
North Atlantic Ocean													
Carrillo, Am. S. S.	Boston	New Orleans	37 30 N.	71 00 W.	1	12p, 1—	2	988.8	SE	SE, 8	NW	SE, 8	SE-W.
Mayari, Pan. S. S.	Banes	Boston	34 42 N.	71 30 W.	2	7a, 2—	2	1,000.3	SSE	NW, 8	SSW, 10	W-NW.	
Hamilton, U. S. C. G.	On Station No. 1		38 42 N.	59 30 W.	2	2p, 2—	3	993.2	SSE	SSW, 9	WSW	SSE-NNW.	
Bibb, U. S. C. G.	Norfolk	Station No. 2	38 00 N.	68 00 W.	2	5p, 2—	3	989.8	SW	S, 10	WSW	S-WSW.	
West Lashaway, Am. S. S.	Freetown	Boston	38 20 N.	66 21 W.	2	8p, 3—	3	1,013.5	SW	N, 7	N	W, 9	
General Greene, U. S. C. G.	On ice patrol		44 48 N.	45 12 W.	3	9p, 3—	3	1,000.0		NNE, 8		NNE, 8	
Hamilton, U. S. C. G.	On Station No. 1		38 42 N.	59 06 W.	4	10p, 3—	4	997.0	N	WNW, 3	NNW	NNW, 8	SW-N.
Excalibur, Am. S. S.	Lisbon	Bermuda	38 00 N.	51 00 W.	4	10a, 4—	4	996.3	WSW	WSW, 8	WNW	WNW, 8	S-WNW.
Bibb, U. S. C. G.	Norfolk	Station No. 2	38 54 N.	49 24 W.	4	2p, 4—	5	993.6	NNW	E, 1	NNW	NW, 8	E-WSW.
Spencer, U. S. C. G.	On Station No. 2		39 00 N.	46 00 W.	3	5p, 4—	3	991.5	S	WSW, 5	S	S-8	SSW-NNW.
Santa Ana, Am. S. S.	New York	Cristobal	35 25 N.	74 14 W.	5	2p, 5—	5	995.6	S	SSW, 6	NW	S, 8	S-NW.
Seatrail, New Jersey, Am. S. S.	Texas City	do	36 15 N.	74 37 W.	5	3p, 5—	5	999.7	W	S, 6	W	W, 8	S-W-WSW.
A vessel	Cristobal	do	34 53 N.	73 58 W.	5	4p, 5—	5	1,008.8	ESE	SW, 4	SSE	S, 11	SSE-NNW-SW.
Ewa, Am. S. S.	do	do	32 54 N.	74 06 W.	5	4p, 5—	5	1,002.0	SSE	SSW, 6	SSE	SSE, 9	SSE-SW.
Gulfcrest, Am. M. S.	do	La Cruz, Venez.	35 54 N.	71 42 W.	5	7p, 5—	5	999.7	SE	SSW, 9	SE	SE, 11	SSE-SSW.
Montgomery City, Am. S. S.	Cristobal	Boston	38 00 N.	71 00 W.	5	4a, 6—	7	1,000.0	SE	W, 3	NE	NE, 10	NNE-W.
Spencer, U. S. C. G.	Station No. 2	New York	38 54 N.	63 36 W.	6	4p, 6—	7	994.9	SW	WSW, 5	NNE	NE, 9	SW-NW.
Hamilton, U. S. C. G.	On Station No. 1		38 30 N.	59 06 W.	6	2a, 7—	7	992.6	SSE	WSW, 8	SSW, 9	SW-NW.	S-NE.
General Greene, U. S. C. G.	On ice patrol		42 34 N.	47 02 W.	7	2p, 7—	7	993.6	SW	S, 10	WSW	S, 10	
Bibb, U. S. C. G.	On Station No. 2	New York	38 12 N.	45 48 W.	7	4a, 8—	8	1,005.1	S	S, 8	S	S, 10	N-NNE.
Mormacyork, Am. M. S.	Trinidad	Baltimore	35 07 N.	71 06 W.	8	4a, 8—	8	1,013.2	NNE	NNE, 7	N	NE, 8	None.
Duane, U. S. C. G.	On Station No. 1	Baltimore	39 18 N.	60 12 W.	12	4p, 12—	12	1,018.6	N	N, 8	SW	SW, 8	SW-WNW.
Bibb, U. S. C. G.	On Station No. 2	Baltimore	38 54 N.	46 00 W.	19	3p, 19—	19	1,011.5	SW	SW, 7	W, 2	NNE, 8	SW-NW.
Clare, Am. S. S.	Jacksonville	Baltimore	33 06 N.	77 00 W.	22	1a, 22—	22	1,019.3	N	N, 8	NE, 8	NE, 8	
Pan Massachusetts, Am. S. S.	Galveston	Boston	41 06 N.	69 18 W.	26	4a, 27—	27	1,009.8	NE	NE, 8	NE	NE, 8	
Bibb, U. S. C. G.	Station No. 2	Norfolk	37 36 N.	63 54 W.	27	9a, 27—	28	1,008.5	S	SW, 7	NW	NNW, 9	SSW-W.
Exhibitor, Am. S. S.	Trinidad	Boston	39 18 N.	68 42 W.	27	2a, 28—	28	1,007.5	NW	NNW, 8	NW	NW, 8	NW-NNW.
A. S. Hansen, Am. S. S.	Smith's Bluff, Tex.	Carteret, N. J.	26 12 N.	88 00 W.	28	12m, 28—	28	1,015.2	E	E, 8	E	E, 8	
Spencer, U. S. C. G.	On Station No. 2		39 00 N.	46 00 W.	28	3p, 29—	29	1,002.0	S	W, 5	SW	S, 8	SW-WNW.
North Pacific Ocean													
West Cusseta, Am. M. S.	Yokohama	Vancouver, B. C.	42 30 N.	153 30 E.	1	11a, 1—	1	1,002.0		WNW, 8	WNW	WNW, 8	
Dellwood, Am. S. S.	Seattle	Dutch Harbor	52 40 N.	151 00 W.	1	6p, 1—	2	980.7	SSE	SE, 8	N	SE, 9	SE-E.
F. J. Luckenbach, Am. S. S.	Portland, Oreg.	San Francisco	43 54 N.	124 30 W.	2	4p, 2—	2	1,003.1	S	S, 7	SSE	SSW, 8	SE-S.
A vessel	Zamboanga, P. I.	Los Angeles	38 24 N.	149 12 W.	2	12p, 2—	3	993.7	WSW	W, 10	WNW	W, 11	WSW-WNW.
Diamond Head, Am. S. S.	St. Helens, Oreg.	Hilo	36 30 N.	138 30 W.	3	8a, 3—	4	1,000.0	SSW	SSW, 8	W	W, 8	SSW-W.
West Cusseta, Am. M. S.	Yokohama	Vancouver, B. C.	45 29 N.	162 47 E.	3	3p, 3—	4	983.7	ENE	N, 9	NW	NW, 11	ENE-NW.
Waimea, Am. S. S.	San Francisco	Honolulu	35 21 N.	129 21 W.	4	8p, 3—	4	1,005.8	W	S, 7	WNW	W, 8	S-SW.
J. A. Moffett, Am. S. S.	Richmond, Calif.	Pt. Wells, Wash.	43 10 N.	124 57 W.	3	6p, 4—	5	992.9	SSE	SW, 8	W	SSW, 9	SSW-WSW.
West Cusseta, Am. M. S.	Yokohama	Vancouver, B. C.	49 54 N.	168 33 W.	8	6a, 8—	8	995.3	W	SSE, 4	W	W, 10	SSE-SW.
President Buchanan, Am. S. S.	Hong Kong	San Francisco	31 48 N.	157 30 E.	8	10p, 9—	9	1,014.6	NW	NW, 8	NW, 8	WNW-NNW.	
President Pierce, Am. S. S.	San Francisco	Yokohama	42 48 N.	135 18 W.	9	3p, 9—	9	1,003.7	NW	WSW, 4	NW	NW, 9	WSW-NW
Meigs, U. S. A. T.	Singapore	Los Angeles	40 38 N.	175 00 E.	9	1a, 10—	10	971.9	SE	W, 8	W	W, 10	SE-W.
Manulan, Am. S. S.	San Francisco	Honolulu	36 30 N.	126 42 W.	10	4a, 10—	10	1,005.1	NW	W, 5	WNW	WNW, 10	W-WNW.
West Cusseta, Am. M. S.	Yokohama	Vancouver, B. C.	50 22 N.	155 15 W.	9	12m, 10—	11	991.2	SE	SSW, 8	SW	SSW, 10	S-SW.
Matsonia, Am. S. S.	San Francisco	Honolulu	37 33 N.	123 00 W.	11	8p, 11—	12	1,003.4	NW	NW, 7	NNW	NNW, 9	NW-NNW.
Baranol, Am. S. S.	Seattle	Seward	59 06 N.	141 18 W.	14	9a, 13—	14	1,008.1	SSW	SE, 8	SE	N, 9	
Irwin L. Hunt, U. S. A. T.	Honolulu	San Francisco	37 45 N.	122 42 W.	15	8p, 15—	15	1,017.6	NNW	NNW, 8	NE	N, 9	
President Buchanan, Am. S. S.	Hong Kong	do	41 41 N.	155 00 W.	14	9p, 15—	15	1,004.1	SE	SE, 10	ESE	SE, 10	ESE-SE.
Swiftsure Bank Lightship, U. S.	On station		48 33 N.	125 00 W.	14	4p, 14—	16	1,014.2	W	W, 6	W	W, 8	None.
Makua, Am. S. S.	Honolulu	San Francisco	37 30 N.	123 48 W.	15	2a, 16—	16	1,025.1	N	N, 9	SSE	N, 9	
Neches, Am. S. S.	Dutch Harbor	Kodiak	55 30 N.	156 30 W.	17	6p, 17—	17	1,008.1	NNE	NE, 8	NE	NE, 8	NE-ENE.
Kamakura Maru, Jap. M. S.	Honolulu	Honolulu	36 48 N.	125 30 W.	17	10p, 17—	18	1,019.5	N	NNW	NNW	NNW, 8	
Tuscaloosa City, Am. S. S.	Honolulu	Balboa	13 54 N.	101 18 W.	25	5p, 24—	25	1,007.8	ESE	N, 4	NE	ENE, 7	N-E.
Satartia, Am. S. S.	Catabangan, P. I.	Los Angeles	41 18 N.	175 31 W.	28	4a, 28—	28	993.6	SW	SW, 3	WNW	WNW, 9	

¹ Position approximate.

² Barometer uncorrected.